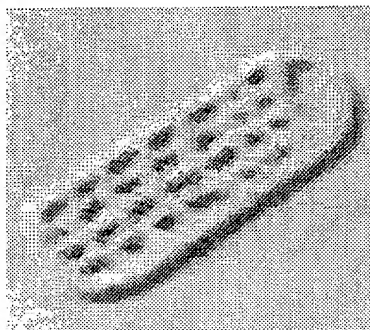




# The Nanotube Site

<http://www.pa.msu.edu/cmp/c>



Maybe the most significant spin-off product of fullerene research, leading to the discovery of the  $C_{60}$  "buckyball" by the 1996 Nobel Prize laureates Robert F. Curl, Harold W. Kroto and Richard E. Smalley, are nanotubes based on carbon or other elements. These systems consist of graphitic sheets seamlessly wrapped to cylinders. With only a few nano-meters in diameter, yet (presently) up to a milli-meter long, the length-to-width aspect ratio is extremely high. A truly molecular nature is unprecedented for macroscopic devices of this size. Accordingly, the number of both specialized and large-scale applications is growing constantly.

The idea to establish a dedicated Nanotube Site was conceived during the seminal ONR-sponsored Workshop on "Carbon Nanotubes - Opportunities, Requirements, and Challenges" at Rice University, from May 30 - June 1, 1997 (see also Malcolm Brown's photo album).

The primary purpose of The Nanotube Site is to facilitate the exchange of ideas among researchers by concentrating links to sites dedicated to nanotubes. One of the benefits is to provide an easier (or better structured) electronic access to bibliographical information and preprints. Information about providers of nanotubes is intended to increase the production volume and find new applications for nanotubes.

The Nanotube Site is maintained regularly by David Tomanek, work and travel schedule permitting. Help would be appreciated.

To establish a link to your nanotube page, please [register here](#).

Use **alta**<sup>vista</sup>

to [translate this document to the language of your choice](#).

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## General Information on Carbon Nanotubes:

- [Physical Properties of Carbon Nanotubes \(compiled by Tom Adams\)](#)
- [Carbon Nanotubes: A Time Line](#)





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## Other Nanotube Link Sites:

- [Vincent Meunier: Carbon Nanotubes on the Web](#)
- [University of Reading: Peter Harris's Nanotube Site](#)
- [Nanotechnology and Nanotubes on the Web](#)



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## Nanotube Bibliography:

- [David Tománek and Richard Enbody \(eds.\): "Science and Application of Nanotubes" \(NT'99 Proceedings\)](#)
- [Peter J. F. Harris: "Carbon Nanotubes and Related Structures" \(textbook\)](#)
- [Riichiro Saito, Gene Dresselhaus and Mildred S. Dresselhaus: "Physical Properties of Carbon Nanotubes" \(introductory textbook\)](#)
- [Michigan State University: Nanotube Publications - David Tomanek's Group](#)
- [Dan Asimov: Manuscript Addressing the Geometry of Capped Nanocylinders](#)
- [K. Harigaya: Papers of Nanotubes and Fullerenes](#)
- [Steve Lenhart: Nanotech Guide's Selection of Publications \(bi-weekly\)](#)
- [Steve Lenhart: Nanotech Guide's Electronic Newsletter \(bi-monthly\)](#)



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## List of Relevant Addresses:

- [1999 - NanoteC'99 Workshop at the University of Sussex - Address List of Participants](#)
- [1999 - NANOTUBE'99 Workshop at Michigan State University - Address List of Registered Participants](#)
- [1997 ONR Rice Nanotube Workshop - Address List](#)
- [1994 Address List of Groups Active in Fullerene Research](#)
- [Wolfgang Christen: Address List of Researchers in Cluster Science](#)



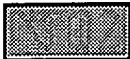
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## Future Events in the Nanotube Field:

- **ISNC2001** - International Symposium on Nanocarbons 2001, Nagano, Japan, 14-16 November 2001.



- **QTSM & QFS'02**: International Conference on Quantum Transport in Sythetic Metals and Quantum Functional Semiconductors, Seoul, Korea, May 8-10, 2002.



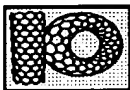
- **NT'02 (NANOTUBE'2002)**: International Conference on the Science and Application of Nanotubes, Boston, Massachusetts, July 6-11, 2002.
- **Calendar of Future Events** in Nanotechnology by Gina "Nanogirl" Miller
- **The Internet Physics Calendar** maintained by the EPS
- **Calendar of Physics Conferences** by Y.S. Kim of the University of Maryland



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## Past Events in the Nanotube Field:

- **N&N2001** - School and Workshop on Nanotubes and Nanostructures, Frascati, Italy, October 17-27, 2001.



- **CNT10** - "Tsukuba Carbon Nanotube Symposium: 10th Anniversary of Nanotube Discovery", Tsukuba, Japan, from October 3 - 5, 2001.
- **NanoteC'01** - Conference on "Nanotechnology in Carbon and Related Materials", University of Sussex at Brighton (UK), August 29 - Septemeber 1, 2001.
- **ADC/FCT 2001**: Sixth Applied Diamond Conference / Second Frontier Carbon Technology Joint Conference, Auburn, Alabama, August 6-10, 2001.



- **NT'01 (NANOTUBE'2001)**: International Workshop on the Science and Application of Nanotubes, Potsdam, Germany, July 22-26, 2001.
- **IWFAC'2001**: International Workshop on "Fullerenees and Atomic Clusters", St. Petersburg, Russia, July 2-6, 2001.
- **AWNF2001**: Australian Workshop on Nanotubes and Fullerenes, Australian National University, Canberra, May 3-4, 2001.
- **FGS'01**: Fullerene General Symposium, Okazaki, Japan, January 22-23, 2001.



- **ISNM'2001**: International Symposium on Nanonetwork Materials: Fullerenes, Nanotubes, and Related Systems, Kamakura, Japan, January 15-18, 2001.
- **N&N'2000**: Nanostructures and Nanotubes workshop in Cagligari, Sardinia, Italy, 24 September - 4 October 2000.
- **NASA Workshop on Nano-Biotechnology**, NASA Langley Research Center, Hampton, VA, June 14-15, 2000.

- The Knowledge Foundation: 2nd Annual Conference on Carbon Nanotubes: Advances in Applications and Production in Miami Beach, Florida, April 10-11, 2000.
- IWEPNM 2000 in Kirchberg, Austria, March 4-11, 2000: International Winterschools on Electronic Properties of Novel Materials
- NASA: Nanospace 2000 Conference, January 23-28, 2000, League City, Texas
- Molecular Simulation '99 - Virtual Web Workshop
- LTFC'99 -- 2nd Workshop on the Application Potential of Low-Temperature Fuel Cells, Lucerne, Switzerland, June 21, 1999



NANOTUBE-99 - Workshop at Michigan State University, July 24-27, 1999.

- NANOTEC'99 - Conference on "Nanotechnology in Carbon and Related Materials", University of Sussex at Brighton (UK), September 8-10, 1999.
- IWFAC'99 -- 4th Biennial International Workshop in Russia on "Fullerenes and Atomic Clusters", St. Petersburg, Russia, October 4 - 8, 1999.
- NAMITECH - Nanotubes for Microstructure Technology workshop in Valladolid, Spain, Fall 1999.



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## Job Market:

- Offering a job in the Nanotube field\*:
  - Kim Bolton (Chalmers University, Sweden): Post-Doc position in computational physics of nanotubes  
(posted 3 February 2002)

\*Outdated postings are automatically removed 12 months after the posting date.



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## Optimized Geometries:

- Young-Kyun Kwon: Cartesian Coordinates of Nanotubes
- Fullerene Gallery of M. Yoshida: Cartesian Coordinates
- UNAM Mexico: Graphitic triply periodic minimal surfaces
- Steffen Weber's Nanotube/Nanocone Java applet
- Steffen Weber's VRML gallery of nanotubes



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## Dedicated Nanotube Sites:

- [NASA: Use of Carbon Nanotubes in Space](#)
- [Rice University: Center for Nanoscale Science and Technology](#)
- [Michigan State University: David Tomanek's Nanotube Page](#)
- [University of California at Berkeley: McEuen Group's Nanotube Site](#)
- [University of Oxford: Malcolm Green's Nanotube Group](#)
- [Walt de Heer's group at Georgia Tech: Physical properties of MWNT's](#)
- [Penn State University: Vincent Crespi's Nanotube page](#) (general audience)
- [Enzo Menna at CNR Padova: Nanotubes and Nanotechnology links](#)
- [University of Kentucky: Advanced Carbon Materials Science Research and Engineering Ctr.](#)
- [NASA JSC Nanotube Site](#)
- [NEC: Nanotubulite Project](#)
- [FHI Berlin: Tobias Hertel's Nanotube Research Site](#)
- [Australian National University in Canberra: Nanotubes produced by ball milling](#)
- [Universite Paris-Sud in Orsay: Fullerenes and Nanotubes](#) (including nanotubes in zeolite and nanotube-based fibers)
- [Oklahoma University: Large Scale Production of Single Walled Nanotubes \(Daniel Resasco\)](#)
- [CARMEL Consortium, Sweden: Development of Nanotube-Based Nano-Electromechanical Devices \(NEMS\)](#)
- [Clemson University: Apparao Rao's Nanotube Research site](#)
- [University of Toulouse: Nanocomposites and Carbon Nanotubes Group](#)
- [Goteborg University, Sweden: Kim Bolton's page on computational nanotube research](#)
- [University of Tokyo: Shigeo Maruyama's Nanotube Site](#)
- [University of Helsinki: Ion irradiation of carbon nanotubes](#)
- [CNRS Nanotube Research Group: Brief nanotube review \(French\)](#)



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## Nanotube Related Sites:

- [Rice University: Rick Smalley's Group Home Page](#)
- [Washington University: Novel Carbon Materials \(Rod Ruoff\)](#)
- [University of Texas: Malcolm Brown's Nanopage](#)
- [University of Pennsylvania: Jack Fischer's Group Home Page](#)
- [University of California at Berkeley: Alex Zettl's Group Home Page](#)
- [University of Kentucky: Peter Eklund's Group Home Page](#)
- [Clemson University: Laboratory for Nanotechnology](#)
- [Delft University of Technology: Cees Dekker's Home Page](#)
- [North Carolina Center for Nanoscale Materials](#)
- [University of Valladolid \(Spain\): Angel Rubio's Home Page](#)
- [University of Sussex: Harry Kroto's Fullerene Group Home Page](#)
- [Tohoku University: Keivan Esfarjani's Nanotube Page](#)
- [Kurchatov Institute: Nick Zhevago's Nanotube Page](#)
- [Weizmann Institute: Daniel Wagner's Page on Mechanical Properties of Carbon Nanotubes and Composites](#)
- [IFW Dresden: Spectroscopy of Fullerenes and Nanotubes](#)
- [Penn State University: Milton Cole's Page on Adsorption in Nanotubes](#)
- [University of California, Los Angeles: Ching-Hwa Kiang's Group Home Page](#)

- [CNRS Odeillo: Tony Guillard's Fullerene and Nanotube Page](#) (in French)
- [Roberto "Maranza" Marangoni's Nanotube Page](#) (in Italian)
- [Stanford University: Hongjie Dai's Group Home Page](#)
- [ICB-CSIC Zaragoza \(Spain\): Group of Carbon Nanostructures and Nanotechnology](#)
- [NIMS Tsukuba \(Japan\): Thomas Laude's Boron Nitride and Carbon Nanostructure pages](#)
- [Max-Planck Institute for Solid State Research in Stuttgart \(Germany\): Synthetic Nanostructures](#)
- [North East Wales Institute of Higher Education: Advanced Materials Research Laboratory](#)
- [Jie Liu's Group at Duke University: CVD Synthesis of Single-Wall Nanotubes](#)
- [The ENEA-ASI Nanotube Project for Spacecraft Materials](#)
- [Steve Lenhart: Nanotech Guide to Nanotubes](#)
- [Research Group For Advanced Carbon of the Institute of Metal Research, Chinese Academy of Sciences](#)
- [University Fribourg \(Switzerland\): Synthesis and Characterization of Carbon Nanostructures and Nanotubes](#)
- [CERCA: Nanostructures and Biomaterials Group - research and bibliography](#)
- [Metu Turkey: Fikret Hasmi's Nanotube Site](#)
- [University of Maryland: Michael S. Fuhrer's Research Page](#)
- [Cambridge University: Charanjeet's Web page on CVD nanotubes](#)
- [Oxford University: Jeremy Sloan's page on 1D crystals in Nanotubes and related topics](#)



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### Links Relevant to Nanotube Research:

- [Bucky News service at the University of Pennsylvania](#)
- [Michigan State University: Cluster Science Collaboration](#)
- [State University of New York at Stony Brook: Buckyball Home Page](#)
- [Res. Inst. for Techn. Physics and Mat. Sci.: Tunneling through a nanotube](#)
- [Cambridge University: Milo Shaffer's Home Page](#)
- [Zyvex: Nanotube 3D Manipulation](#)
- [IBM Nanotechnology Research](#)
- [IBM Nanoscale Science Department: Home Page](#)
- [University of Michigan: SWNT Production in a Reduced Gravity Environment](#)
- [Michigan State University: Daily InScight Report and Molecular Dynamics Simulation of a Nanotube-Based Memory Element](#)
- [IBM Research Centers: Nanoscience](#)
- [University of Warwick: Links to Fullerene Sites](#)
- [Harvard University: Nanotube AFM Tips Produced by Chemical Vapor Deposition](#)
- [University of Montpellier: Growth and characterization of single-wall carbon nanotubes produced by the solar method](#)
- [National Institute of Materials and Chemical Research, Japan: Molecular Reaction Engineering Group](#)
- [Michigan State University: Introduction to Nanotubes \(Undergraduate Project\)](#)
- [Jeonbuk National University, Korea: Synthesis of aligned carbon nanotubes](#)
- [Australian National University: Nanotube research at the Atomic and Molecular Physics Laboratories](#)
- [Berkeley Lab: Electronic Devices within Carbon Nanotubes](#)
- [Univ. of Ulm and MPI Stuttgart: Carbon Nanostructures page of Florian Banhart](#)
- [Purdue University: Nanotube Research in Ron Reifenberger's Lab](#)
- [Georgia Tech: Nanotube and Nanowire Research in Z.L. Wang's Group](#)
- [Steve Lenhart: Nanotech Guide's Glossary of Nanotech Terms](#)
- [Nanotechnology Lab: Nanotube related links](#)

- [NanotechNews: News related to Nanotechnology](#)



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## Sources of Nanotubes and Nanotube-Based Products:

- [Non-Commercial Sources](#)
- [Commercial Sources](#)



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## Other:

- [Research Funding Sources for Nanotechnology](#)
- [ORNL: Nanotube-Based Piston](#)
- [NCSU: Physics Page of Charles Brabec](#)
- [MIT: Fullerene Patent Database](#)
- [Rice Press Release: CNST Brings Nanoscale Products Closer to Market](#)
- [MIT: Carbon Nanocapsule \(Riichiro Saito\)](#)
- [NEC: Bamboo version of nanotubes \(S. Iijima\)](#)
- [NEC: Bambooware](#)
- [Emory Univ.: Nanotubes of cyclic peptides](#)
- [University of Namur \(Ph. Lambin\): Connecting carbon nanotubes](#)
- [Rice University: Smalley group's image gallery](#)
- [Scientific American Magazine: "Turn of the gear"](#)
- [TechExpo: The Online Expositions for High Technology](#)
- [Peter Butzloff: Nanotube Poetry Volume 1, Volume 2, Volume 3](#)
- [Sergei V. Kozyrev: Fullerenes World](#)
- [ETH Zürich: Home page of the Nesper group](#)
- [Boston College: Zhifeng Ren's Group](#)
- [AIST, Japan: Fullerene Forum](#)
- [Purdue University: Yongqiang Xue's Molecular Electronics Page](#)
- [Investigating Patterns: Symmetry and Tessellations](#)
- [CSIRO media release of 16 June 1999: Nanotubes for better TV screens](#)
- [Jeff Shaw at MSU: A Student Guide to Nanotechnology](#)
- [Encyclopedia Britannica: Listing of Nanotube-Related Topics](#)
- [Scientific American Magazine, June 2000: "Tantalizing Tubes"](#)
- [PhysicsWeb/Physics World, June 2000: "Carbon nanotubes roll on", "Multiwall carbon nanotubes", "Single-wall carbon nanotubes", "Controlling nanotube growth", "Industry sizes up nanotubes"](#)





[... back to David Tomanek's home page](#)

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*David Tomanek at Michigan State University*

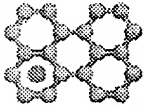


[tomanek@pa.msu.edu](mailto:tomanek@pa.msu.edu)

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Graphics layout: [Tom Adams](#)

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[nanoTEN Logistic Support](#)

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[Document http://www.pa.msu.edu/cmp/csc/nanotube.html](http://www.pa.msu.edu/cmp/csc/nanotube.html)  
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[Last update: 1999.05.26 \(Wednesday\) 14:27:27 EDT](#)